

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

INTERDEPARTMENT CORRESPONDENCE

FILE: CSSTP-0007-00(319) Hall Co.
P.I. No.: 0007319
SR 347 Lanier Island Pkwy

OFFICE: Engineering Services

DATE: July 29, 2013

FROM: Lisa L. Myers, State Project Review Engineer 

TO: Genetha Rice-Singleton, State Program Delivery Engineer
Attn.: Ryan Fernandez

SUBJECT: IMPLEMENTATION OF VALUE ENGINEERING STUDY ALTERNATIVES

The Value Engineering Study for the above project was held May 6-9, 2013. Responses were received on July 19, 2013. Recommendations for implementation of VE Study Alternatives are indicated in the table below. The Project Manager shall incorporate the VE alternatives recommended for implementation to the extent reasonable in the design of the project. Please note, if the implementation of a VE recommendation requires a Design Exception and/or Design Variance, the DE or DV must be requested separately.

ALT #	Description	Potential Savings/ LCC	Implement	Comments
R-1.0	Eliminate Roundabout and make Big Creek Road and New Bethany Road a stop controlled intersection.	\$1,699,455	No	The proposed roundabout is a context sensitive solution for an area that has several existing roundabouts in close proximity to this project. There is currently a proposal to donate the Right of Way to reduce the extra cost associated with the roundabout design. The donation of the property results in a revised savings amount of \$586,455 for the two-way stop control alternate. Other advantages of choosing the roundabout design include: <ul style="list-style-type: none">• Reducing the amount of conflict points between the main road and side road.• Idling time of off-peak side road traffic would be reduced.
R-2.0	Reduce the design and posted speed limits from 45 mph to 35 mph on SR 347 west of McEver Road.	\$1,773,859	No	This roadway is an urban minor arterial and the adjacent Phase I project is classified as the same and has a posted and design speed of 45 mph. A speed study for SR 347 was conducted which include calculations of the 85 th percentile speed and

				currently the traffic is traveling in excess of the 45 mph posted speed.
R-3.0	Reduce horizontal curves from Sta. 10015+00 to Sta. 10025+00.	\$136,909	No	<p>The 1,042 feet radius for the horizontal curve provides vehicles with a smooth transition to and from the steep Lazy Day Marina driveway. It also eliminates the existing reverse curves which currently has a 96 feet tangent between the two curves. This alternative proposes two curves only separated by a 29 feet tangent length which is inadequate to properly develop a transition point between the two curves.</p> <p>The GDOT Design Policy Manual requires roadways with design speeds less than or equal to 45 mph to provide a minimum tangent of 100 feet between reverse curves even if super elevation is not required.</p>
R-4.0	Reduce horizontal curves from Sta. 10030+00 to Sta. 10041+00.	\$310,222	Yes	This will be done.
R-6.0	Create one-way pairs from Rowe Drive to North Waterworks Road (Eastbound along existing SR 347 and Westbound on new location).	\$455,784	No	The preferred design is a roundabout which is a context sensitive solution for an area that has several existing roundabouts in close proximity to this project. There is currently a proposal to donate the Right of Way to reduce the extra cost associated with the roundabout design. The donation of the property results in a revised savings amount of \$586,455.
R-7.0	Reduce the shoulder on the sidewalk side from 16 feet wide to 12 feet wide.	Proposed = \$141,840 Actual = \$103,699	Yes, with modifications	The reduction of the shoulder width will only be made from Lake Lanier to Beards Road. The shoulder will remain 16 feet wide from Beards Road to McEver Road since adequate Right of Way exists in this location.
R-8.0	Use asphalt in lieu of concrete for the 10 feet wide multi-use trail.	\$265,080	No	Both the Phase I SR 347 project and the Phase II project to the east provide a concrete multi-use trail as part of their designs. The multi-use trail that runs through the Lake Lanier recreational area also has a concrete multi-use trail/path. In order to maintain consistency and durability throughout the SR 347 corridor this multi-use path will remain concrete.

R-9.0	Eliminate realignment of New Bethany Road at existing SR 347.	\$166,840	No	New Bethany Road is a 45 mph roadway which provides access to the church property as well as residential properties. The realignment of New Bethany Road will create a four leg intersection with Big Creek Road and remove the 60 foot distance between the existing New Bethany Road intersection and the existing Big Creek Road intersection. The realignment will also eliminate the number of turn movements vehicles must make when leaving New Bethany Road to access Big Creek Road and vice versa.
R-10.0	Eliminate relocation of Lee Circle between relocated SR 347 and the existing SR 347.	\$21,247	Yes	This will be done.
R-11.0	Move eastern cul-de-sac on existing SR 347 east approximately 425 feet and eliminate extension of three driveways to the relocated SR 347.	\$16,009	Yes	This will be done.
R-12.0	Eliminate short acceleration lanes at Holiday Road and Joy Drive.	\$12,246	Yes	This will be done.
R-13.0	Reduce length of right turn lane into Holiday Marina.	\$155,406	No	The proposed 715 feet turn lane length will alleviate the queue created when large vehicles towing boats and campers wait at the entrance gate for access to the Holiday Marina.
R-16.0	Use 12 feet wide travel lanes and reduce turn lane width from 14 feet to 12 feet wide.	\$217,464	No	The 14 feet wide turn lane provides turning room for larger vehicles that tow boats and campers as well as trucks making business deliveries. The most current traffic counts show 6.5% 24-hour truck traffic at the McEver Road end of the project and 7.5% 24-hr truck traffic within the vicinity of Big Creek Road and New Bethany Road/Lake Lanier end of the project. These percentages increase during the Summer months due to the boaters and vacationers accessing Lake Lanier, the Island Resort, and recreational activities.

The Office of Engineering Services concurs with the Project Manager's responses.

Approved:  Date: 7/29/10
Russell McMurry, P.E., Chief Engineer

LLM/RLR/MJS
Attachments

c: Joe Carpenter/Paul Liles
Genetha Rice-Singleton/Hiral Patel/Ryan Fernandez
Andy Casey/Theresa Holder/Josh Taylor/Sonya Sykes
Marc Mastronardi
Mike Murdoch/Frank Scott
Harold Mull/Matt Needham/Jason Dykes
Ken Werho/Nabil Raad
Robert Reid Jr. /Matt Sanders

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE CSSTP-0007-00(319), Hall County OFFICE Program Delivery
P.I. No. 0007319
SR 347 from McEver Road to Lake Lanier Islands DATE July 18, 2013

FROM Genetha Rice-Singleton, State Program Delivery Engineer *Albert Shelby for*

TO Lisa Myers, State Project Review Engineer
Attn: Matt Sanders

SUBJECT Response to Value Engineering Study Alternatives

Attached are the responses for the Value Engineering Study – Final Report dated May 24, 2013 for the above referenced project. This office concurs with the responses.

If there are any questions please contact Ryan Fernandez of this Office at (404) 631-1162.


AVS
GRS:AVS:RCF
Attachments

Cc:

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

INTERDEPARTMENT CORRESPONDENCE

FILE: CSSTP-0007-00(319) Hall County **OFFICE:** Roadway Design
P.I. No.: 0007319
SR 347 / Lanier Islands Pkwy from
Lake Lanier to McEver Road
Widening & Reconstruction **DATE:** July 16, 2013

FROM:  C. Andy Casey, P.E., State Roadway Design Engineer

TO: Genetha Rice-Singleton, State Program Delivery Engineer
Attn.: Ryan Fernandez, Project Manager

SUBJECT: RESPONSE TO VALUE ENGINEERING STUDY ALTERNATIVES

The Office of Roadway Design's responses and recommendations are attached for the "Value Engineering Study – Final Report" dated May 24, 2013 for the above referenced project.

If you have any questions, please contact Joshua Taylor at 404-631-1659 or Sonya Sykes at 404-631-1698.

CAC:JBT:sas
Attachment

cc: Joe Carpenter, P.E., Engineering Division Director

Attachment 1: Response to Value Engineering Alternatives for CSSTP-0007-00(319) Hall County, P.I. No.: 0007319, SR 347 / Lanier Islands Pkwy from Lake Lanier to McEver Road widening & reconstruction

Recommendation R-1.0: Eliminate Roundabout and make Big Creek Road and New Bethany Road stop controlled.

VE Team Savings: \$1,699,455

No, will not implement.

The proposed roundabout at Big Creek Road is a context sensitive solution for an area that has several existing roundabouts in close proximity to the project. There is currently a proposal to donate the necessary Right of Way so as to reduce the extra cost associated with a roundabout design. Other advantages of the roundabout design over a two-way stop control intersection design are:

- Conflict points between main road and side road traffic will be reduced
- The idling time of off-peak side road traffic would be reduced since roundabout designs require traffic to initially yield versus coming to a complete stop.

The donation of the property results in a Right of Way cost similar to the Right of Way cost of a two-way stop control intersection design. This results in a revised VE Team savings of \$586,455 instead of \$1,699,455 for the two-way stop control intersection alternate.

	VE Team Savings	Design Team Savings
Original Design:	\$15,803,871	\$15,803,871
Proposed Change:	\$14,104,416	\$0
Donated ROW:	\$0	\$1,113,000
Original Savings:	\$1,699,455	
Revised Savings:	\$586,455	

Recommendation R-2.0: Reduce design and posted speed from 45 mph to 35 mph West of McEver Road (entire project).

VE Team Savings: \$1,773,859

No, will not implement.

The functional classification for this roadway is an urban minor arterial. The adjacent Phase I project is also classified as an urban minor arterial and has a posted and design speed of 45 mph. Chapter 7 of AASHTO's A Policy on Geometric Design of Highways and Streets, 6th Edition (2011 Green Book) states that "...design speeds for urban arterials generally range from 30 to 60 mph. Lower speeds apply in central business districts and in more developed areas, while higher speeds are more applicable to outlying suburban and developing areas." Furthermore, Chapter 2 of the 2011 Green Book states that urban arterial street speeds in the lower portion of the 20 to 45mph range are applicable to local and collector streets through residential areas and to arterial streets through crowded business areas, while the speeds in the higher portion of the 20 to 45mph range apply to high-type arterials in outlying suburban areas. A speed study for SR 347 was

conducted which included calculations for the 85th percentile speed. The study shows currently traffic is travelling in excess of the 45 mph posted speed.

SPEED STUDY					
City:	County:	Hall	Date:	6/11/13	
Location: SR 347 1 Mile North of McEver Road	Mile Log:	2.60			
Speed Limit: 45	Day:	Tuesday	Road Surface:	DRY	
Speed From: 15	Speed To: 75		Weather:	CLEAR	
Time From: 10:32	Time To: 10:47		Recorder:	RUSTY MADDOX	
Results					
Number of Vehicles Counted =			61		
85th Percentile =			46.1 mph		
10 mph Pace =			mph		
Percent in Pace =			%		
Num. Vehicles in Pace =			vehicles		
Ave. Speed =			mph		
50th Percentile =			41.8 mph		
90th Percentile =			46.5 mph		
95th percentile =			47.0 mph		

Recommendation R-3.0: Reduce horizontal curves from Station 10015+00 to 10025+00.
VE Team Savings: \$136,909

No, will not implement.

The 1,042 foot radius currently proposed for the horizontal curve from Station 10015+00 to Station 10025+00 provides turning vehicles with a smooth transition to and from the steep Lazy Day Marina driveway. The proposed 1,042 foot radius eliminates the existing reverse curve design which currently has a 96.48 foot tangent between the two curves. The VE Team proposed a reverse curve design whereby a 720 foot radius curve would be followed by a 2,083 radius curve. The two curves would be separated by a 29.84 foot tangent length, which is inadequate to properly develop a transition point between the two curves. The Georgia Department of Transportation (GDOT) Design Policy Manual (DPM) Section 4.2.2 requires roadways with design speeds less than or equal to 45 mph to provide a minimum tangent of 100 feet between reverse curves, even if superelevation is not required. The runout and tangent lengths required for the 720 foot and 2,083 foot curves for a 45 mph design speed and 4% maximum superelevation are as follows:

Radius (feet)	Design Superelevation (%)	Lr = Minimum length of Superelvation Runoff (feet)	Lt = Minimum length of tangent runout (feet)
720	3.8	106	56
2,083	2.8	78	56

Recommendation R-4.0: Reduce horizontal curves from Station 10030+00 to 10041+00.
VE Team Savings: \$310,222

Yes, will implement.

The horizontal curve from Station 10030+00 to Station 10041+00 will be reduced from 1042 feet to 900 feet in order to bring the proposed horizontal alignment closer to the existing horizontal alignment and in conjunction reduce impacts to the U.S. Army Corps of Engineers property.

Recommendation R-6.0: From Rowe Drive to North Waterworks Road create one-way road East on existing SR 347 and one-way West on new location of SR 347.

VE Team Savings: \$455,784

No, will not implement.

The preferred design is the roundabout design which provides the area with a context sensitive solution over the one-way pair design recommendation. There are several existing roundabouts in close proximity to the project and there is currently a proposal to donate the necessary Right of Way in order to reduce the cost of the roundabout design alternative. This donation would result in a revised savings of \$586,455.

	VE Team Savings	Design Team Savings
Original Design:	\$15,803,871	\$15,803,871
Proposed Change:	\$14,104,416	\$0
Donated ROW:	\$0	\$1,113,000
Original Savings:	\$1,699,455	
Revised Savings:	\$586,455	

Recommendation R-7.0: Reduce shoulder on sidewalk side from 16' to 12' wide.

VE Team Savings: \$141,840

Yes, will partially implement.

A reduction in the shoulder width from 16 feet to 12 feet will be made from Lake Lanier to Beards Road only. The shoulder width will remain 16 feet from Beards Road to McEver Road since adequate Right of Way exists in this location. The 16 foot shoulder proposed to the south of the existing centerline is also consistent with the 16 foot shoulder proposed for the Phase I project located to the east of this project. The reduction in shoulder width from 16' to 12' from Lake Lanier to Beards Road will help reduce impacts to the CORP property and surrounding area.

	VE Team Savings	Design Team Savings
Original Design:	\$567,360	\$567,360
Proposed Change:	\$425,520	\$463,661
Savings:	\$141,840	\$103,699

Design Team Savings Calculations (Based on the VE Study Layout):

Total Project Length = 12,310 feet

12 foot urban shoulder (Lake Lanier to Beards Road) = 9000 feet

- $(9000 / 12,310) \times 100 = 73.11\%$

16 foot urban shoulder (Beards Road to Project End) = 3310 feet

- $(3310 / 12,310) \times 100 = 26.89\%$

Grading Cost per foot of width = \$35,460 (Taken from the VE Team's calculations)

As a result:

\$35,460 x 16 feet x 26.89% =	\$152,563
<u>\$35,460 x 12 feet x 73.11% =</u>	<u>\$311,098</u>
Total =	\$463,661

Recommendation R-8.0: Use asphalt in lieu of concrete for 10' wide multi-use trail.
VE Team Savings: \$265,080

No, will not implement.

The Phase I SR 347 project from McEver Road to I-985 and the SR 347 project from I-985 to SR 211, both to the east of the Phase II project, provide a concrete multi-use trail as part of their proposed designs. The multi-use trail that runs through the Lake Lanier recreational area also has a concrete multi-use trail / path. In order to maintain consistency throughout the SR 347 corridor the multiuse path will remain a concrete design.

Recommendation R-9.0: Eliminate realignment of New Bethany Road at existing SR 347.
VE Team Savings: \$166,840

No, will not implement.

New Bethany Road is a 45 mph roadway that provides access to the church property as well as residential properties. The realignment of New Bethany Road will create a four leg intersection with Big Creek Road and remove the 60 foot distance between the existing New Bethany Road intersection and the existing Big Creek Road intersection. It also will eliminate the number of turn movements vehicles make when leaving New Bethany Road to access Big Creek Road and vice versa.

Recommendation R-10.0: Eliminate relocation of Lee Circle between relocated and existing SR 347.
VE Team Savings: \$21,247

Yes, will implement.

The proposed segment between Lee Circle and Merritts Drive can be removed and Merritts Drive traffic would access proposed SR 347 via Rowe Drive or existing SR 347 to the proposed Big Creek Road / New Bethany Road intersection.

Recommendation R-11.0: Move eastern cul-de-sac on existing SR 347 to east approximately 425' and eliminate extension of 3 driveways to relocated SR 347.

VE Team Savings: \$16,009

Yes, will implement.

Multiple driveway impacts are eliminated by moving the eastern cul-de-sac on existing SR 347.

Recommendation R-12.0: Eliminate short acceleration lanes at Holiday Road and Joy Drive.

VE Team Savings: \$12,246

Yes, will implement.

The short acceleration lanes are not necessary at the Holiday Road and Joy Drive locations since there is no need for U-turn movements on SR 347.

Recommendation R-13.0: Reduce length of right-turn lane into Holiday Marina.

VE Team Savings: \$155,406

No, will not implement.

The proposed 715 foot turn lane length will alleviate the queue created when large vehicles towing boats and campers wait at the entrance gate for access to the Holiday Marina.

Recommendation R-16.0: Use 12' travel lanes and reduce turn lane width from 14' to 12'.

VE Team Savings: \$217,464

No, will not implement.

The 14' wide turn lane provides turning room for larger vehicles that tow boats and campers as well as trucks making business deliveries. The most current traffic counts show 6.5% 24 HR truck traffic at the McEver Road end of the project and 7.5% 24 HR truck traffic within the vicinity of Big Creek Road and New Bethany Road / Lake Lanier end of the project. These percentages are increased during the summer months due to the boaters and vacationers accessing Lake Lanier, the island resort, and recreational activities.

Attachment 2: Highway Safety Manual (HSM) Analysis for Value Engineering (VE) Study Recommendations

The Highway Safety Manual (HSM) Part C – Volume 2 provides a predictive method for estimating expected average crash frequency of a network, facility, or individual site. The Georgia Department of Transportation (GDOT) Roadway and District Design offices use the HSM to estimate expected average crash frequency of alternative proposed upgrades or treatments to existing roadway conditions and to estimate expected average crash frequency of proposed new roadways using the design year traffic volumes and the proposed geometric design characteristics of the roadway.

The HSM predictive models are used to estimate the predicted average crash frequency for a particular site type using a regression model developed from data for a number of similar sites. These regression models, called safety performance functions (SPFs), have been developed for specific site types and “base conditions” that are the specific geometric design and traffic control features of a “base” site. SPFs are typically a function of only a few variables, primarily average annual daily traffic (AADT) volumes. This analysis uses ADT since AADT is typically not available for GDOT projects.

Adjustment to the prediction made by an SPF is required to account for the difference between base conditions, specific site conditions, and local/state conditions. Crash modification factors (CMFs) are used to account for the specific site conditions which vary from the base conditions. A calibration factor is used to account for differences between the jurisdictions(s) for which the models were developed and the jurisdiction for which the predictive method is applied. GDOT currently has no calibration factor.

The HSM Part D – Volume 3 CMFs are used to estimate the change in crashes as a result of implementing a countermeasure(s). Applying the Part D material occurs in projects in which the existing roadway network is assessed and modifications are identified, designed, and implemented with the intent of improving the performance of the facility from a capacity, safety, or multimodal perspective.

The HSM Part C – Volume 2 has been referenced to determine if a predictive method is available to estimate the expected average crash frequency of the proposed roadway design and provide a comparison to the expected average crash frequency of each VE Study recommendation. Part D – Volume 3 of the HSM has also been referenced for individual Crash Modification Factors (CMFs) to determine the expected percentage increase or decrease in crash frequency as it relates to the proposed roadway design and compare each VE Study recommendations expected percentage increase or decrease in crash frequency if available.

The Predictive Method for Urban and Suburban Arterials (Chapter 12) of the HSM classifies the roadway on this project as a three-lane urban arterial (3T) including a center two-way left turn lane (TWLTL). The HSM indicates a Predictive Method analysis can be completed using a CMF for the TWLTL; however, a CMF is not provided for the SPF to account for the TWLTL. Thus no complete Predictive Method analysis is available to analyze the following VE Study recommendations and compare these recommendations to the proposed design.

- R-1.0 Eliminate roundabout and make Big Creek Road and New Bethany stop controlled.

- R-2.0 Reduce design and posted speed from 45 mph to 35 mph West of McEver Road (entire project).
- R-6.0 From Rowe Drive to North Waterworks Road create one-way road East on existing SR 347 and one-way West on new location of SR 347.
- R-11.0 Move eastern cul-de-sac on existing SR 347 to East approximately 425 feet and eliminate extension of 3 driveways to relocated SR 347.
- R-16.0 Use 12 foot travel lanes and reduce turn lane width from 14 feet to 12 feet.

For VE Study recommendation R-2.0, Volume 3 of the HSM (page 17-14) addresses modifying posted speed limit by stating "Drivers tend to drive at the speed that they find acceptable and safe, despite posted speed limits. Little or no effect on operating speed has been found for low- and moderate- speed roads where posted speed limits were raised or lowered. On high- speed roads such as freeways, "studies in the USA and abroad generally show an increase in speeds when speed limits are raised." The HSM goes on to say "The net crash effect of speed limits and changes in speed limits across the transportation network is not fully known. More information is needed to understand how drivers respond to speed limits and how driver behavior can be modified. This information would help to improve how speed limits are set and would help to maximize the results of speed enforcement efforts."

For VE Study recommendation R-11.0, Volume 3 of the HSM (page 13-51) does address potential crash effects of reducing access point density by providing a CMF for Urban and Suburban arterials that provide a reduction in driveways from 26-48 to 10-24 per mile; however, the reduction requested from the VE Study recommendation is minimal (41 driveways to 38 driveways in 2.4 miles).

The CMFs used in the SPF to account for the specific site conditions for Urban and Suburban Arterials include on street parking, roadside fixed objects, median width, lighting, automated speed enforcement, etc. (See page 12-39). Features such as horizontal curve length, sidewalk material type, shoulder width and length of right turn lanes are not considered. As a result the following VE Study recommendations cannot be analyzed and compared to the proposed design:

- R-3.0 Reduce horizontal curves from Station 10015+00 to 10025+00.
- R-4.0 Reduce horizontal curves from Station 10030+00 to 10041+00.
- R-7.0 Reduce shoulder on sidewalk side from 16 feet to 12 feet wide.
- R-8.0 Use asphalt in lieu of concrete for 10 foot wide multi-use trail.
- R-12.0 Eliminate short acceleration lanes at Holiday Road and Joy Drive.
- R-13.0 Reduce length of right-turn lane into Holiday Marina.

The following VE Study recommendations can be analyzed since the analysis involves a comparison between intersection types. The analysis includes comparing the proposed condition – Unsignalized four-leg intersection (stop control on minor-road approaches) (4ST) with the VE Study recommendation – Unsignalized three-leg intersection (stop control on minor-road approaches) (3ST). The results are presented on the next page:

- R-9.0 (Eliminate realignment of New Bethany Road at existing SR 347)

	VE Study Recommendation (3ST)	Proposed Recommendation (4ST)
Total Crashes	0.509	0.544
Fatal and Injury (FI)	0.199	0.194

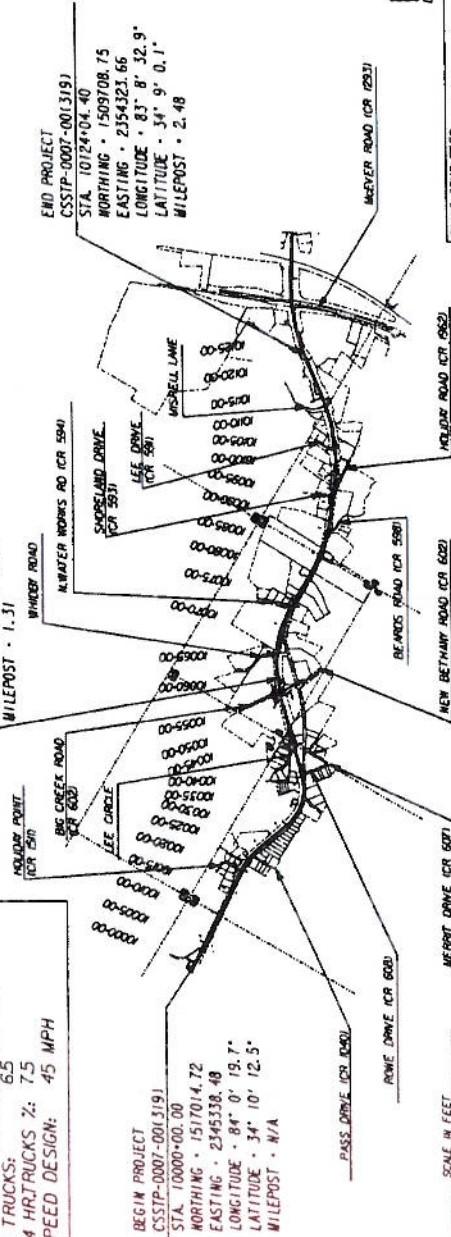
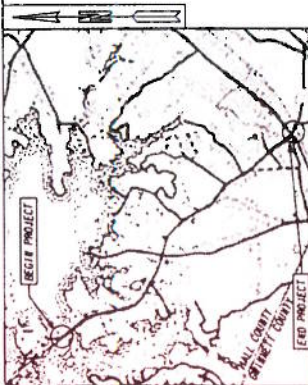
- R-10.0 (Eliminate relocation of Lee Circle between relocated and existing SR 347)

	VE Study Recommendation (3ST)	Proposed Recommendation (4ST)
Total Crashes per year	0.137	0.272
Fatal and Injury (FI) crashes per year	0.068	0.096

The proposed intersection recommendation and the VE Study intersection recommendation show less than 1 total crash per year as well as less than 1 injury and fatal crash per year at the New Bethany Road / SR 347 (existing or proposed) intersection and the Lee Circle / SR 347 (existing or proposed) intersection.

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PLAN AND PROFILE OF PROPOSED
SR 347 / LANIER ISLANDS PARKWAY
FROM LAKE LANIER TO MCEVER ROAD
FEDERAL AID PROJECT
CSSTP-0007-00(319)
HALL COUNTY



LENGTH OF PROJECT	COUNTY NO. 128 Project No. C207-50	MILES
NET LENGTH OF ROADWAY		2.3450
NET LENGTH OF BRIDGES		0.0000
NET LENGTH OF PROJECT		2.3450
NET LENGTH OF EXCEPTIONS		0.0000
CROSS LENGTH OF PROJECT		2.4500

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